

[3.0013]

ACCESSORY PULSATING ORGANS IN THE LEGS OF
Gelastocoris oculatus (Fabricius) (Heteroptera: Gelastocoridae) ¹

Halkard E. Mackey, Jr. ²

During a survey of the morphology of *Gelastocoris oculatus*, pulsating organs used for blood circulation were found in each leg of the adult and the fifth instar nymph. Earlier nymphs were not examined. These organs were seen in the tibia near the point of its articulation with the femur (Fig. 1).

Pulsating organs are apparently widespread in Heteroptera especially in Pyrrhocoridae and Hydrocorisae (Poisson, 1951). Locy (1884a) made numerous observations of their presence in species of *Gerris*, *Corixa*, *Notonecta*, *Belostoma*, *Perthostoma* (Nepidae), and *Ranatra* (Nepidae). Wigglesworth (1965) described a variety of pulsating organs in insects and included a figure of the pulsating organ in the leg of *Notonecta* sp. For those insects studied by Locy (1884a and 1884b), except for *Ranatra* sp., the pulsating organ of the prothoracic leg occurs near the articulation of the tibia and tarsus, while in the other legs its location is near the articulation of the femur and tibia. Brocher (1909), in studies of species of *Ranatra*, *Nepa*, *Corixa*, *Notonecta*, and *Naucoris*, noted the presence of pulsating organs in similar positions. Wigglesworth (1965) also figured the pulsating organ in the prothoracic leg of *Notonecta* sp. as near the articulation of the tibia with the tarsus. Locy (1884a) gave the location of the pulsating organs in *Ranatra* sp. as near the articulation of the tibia and femur in all legs, as did Hamilton (1931) in *Nepa cinerea*. Presswalla and George (1936) stated that the accessory pulsating organs occur in the tibia of all the legs of *Sphaerodema rusticum* (Belostomidae). Brocher (1909) noted that in the nymphs of *Notonecta* sp., Locy (1884a) in the nymph of *Belostoma* sp., and Rawat (1939) in the last instar nymph of *Ilycoris cimicoides* (Naucoridae) that the pulsating

¹ Portion of a dissertation for the University of Tennessee, Knoxville, Tennessee. Accepted for publication February 9, 1970.

² Department of Zoology and Entomology, The University of Tennessee, Knoxville, Tennessee 37916.

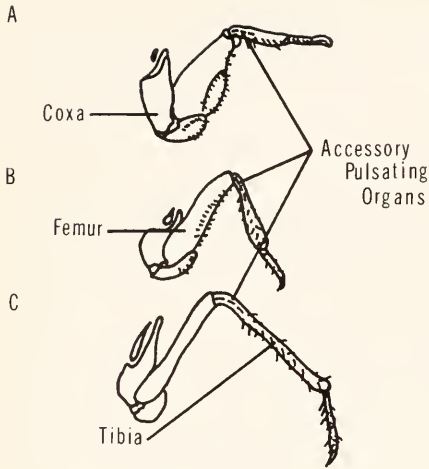


Figure 1. Legs of *Gelastocoris oculatus* showing the location of the accessory pulsating organs. A. Prothoracic leg; B. Mesothoracic leg; C. Metathoracic leg.

organs are situated in all legs near the articulation of the tibia and femur.

Pulsating organs in the legs of Heteroptera apparently are characteristic of Hydrocorisae and Pyrrhocoridae. Even though there appears to be some variation as to the location of these organs in Hydrocorisae, accessory pulsating organs in *Gelastocoris oculatus* may serve as further evidence linking Gelastocoridae with Hydrocorisae. Accessory pulsating organs also occur in at least one genus, *Gerris*, of Amphibicorisae (Locy, 1884a) and in one family, Pyrrhocoridae, of Geocorisae.

Acknowledgements

The author wishes to express his sincere appreciation to Dr. A. C. Cole for his valuable suggestions and criticisms of the manuscript. During his studies, the author was supported in part by a NASA Traineeship and two University of Tennessee Non-Service Fellowships.

Literature Cited

- Brocher, F. 1909. Sur l'organe pulsatile observé dans les pattes des Hémiptères aquatiques. *Annales de Biologie Lacustre*, Bruxelles, 4: 33-41.
- Hamilton, M. A. 1931. The morphology of the water-scorpion, *Nepa cinerea* Linn. (Rhyngochota, Heteroptera). *Proc. Zool. Soc. London*, 1931: 1067-1136.
- Locy, W. A. 1884a. Observations on the pulsating organs in the legs of certain Hemiptera. *American Nat.*, 18: 12-19.
- . 1884b. Anatomy and physiology of the family Nepidae. *American Nat.*, 18: 250-255; 353-367.
- Poisson, R. 1951. *Ordre des Hémiptères*, in Pierre Grasse, ed., *Traité de Zoologie*, Tome X, Fasc. II, pp. 1657-1803.
- Presswalla, M. J. and C. J. George. 1936. The morphology of *Sphaerodema rusticum*. *Journ. Univ. Bombay*, 4: 29-67.
- Rawat, B. L. 1939. Notes on the anatomy of *Naucoris cimicoides* L. (Hemiptera-Heteroptera). *Zoologische Jahrbüch., Abt. Anat. Ontogen. Tiere*, 65: 535-600.
- Wigglesworth, V. B. 1965. *The principles of insect physiology*. Methuen & Co., London. 741 pp.

2.0013 Accessory pulsating organs in the legs of *Gelastocoris oculatus* (Fabricus) (Heteroptera: Gelastocoridae).

Abstract.— The presence of accessory pulsating organs in the legs of *Gelastocoris oculatus* may serve as further evidence linking Gelastocoridae with Hydrocorisae.— **Halkard E. Mackey, Jr.**, Department of Zoology and Entomology, University of Tennessee, Knoxville, Tennessee 37916.

Descriptors: Heteroptera; Gelastocoridae; *Gelastocoris oculatus*; pulsating organs.

The Entomologist's Library

In this section is published each month titles of books, monographs, and articles received and of special interest to entomologists. The contents of each is noted by the editor or invited reviewers. Brief analytical reviews may be submitted for possible publication even if the work has been previously noted here.—Ed.

Publications received.—The following annotated list of publications and short reviews have been received for notation in this section.

Natural History

Woodcock, George 1969. Henry Walter Bates, Naturalist of the Amazons. Barnes and Noble, N. Y. 269 p. Cloth, \$ 5.50.

A brief, but well written and readable account of the life of Henry Bates. Bates relationships with the other great naturalists of his day, Wallace, Darwin, and Hooker, are well brought out.—**S. S. Roback.**

Medical Entomology

James, Maurice T. and Robert F. Harwood 1969. Herm's Medical Entomology, 6th ed. The MacMillan Co., N. Y. ix + 484 p. Cloth, \$ 15.00.

An up-to-date, extensively rewritten book on the biology and control of medically important arthropods. With increased travel spread of arthropod disease vectors, a broad approach to medical entomology problems is stressed. Principles of control are emphasized and the purely taxonomic data has been reduced.—**S. S. Roback.**

Morphology

Chapman, R. F. 1969. American Elsevier Publishing Co., Inc., N. Y. xii + 819 p. Cloth, \$ 13.75.

This deceptively simple book is one of the most valuable reference books on insect morphology and physiology to appear in many years. The thrust of the volume is the integration of structure, function and behavior. There are 6 major sections in the book, starting with the head and including subsections on the appendages, feeding, the alimentary canal, digestion and absorption, nutrition, the fat body and general metabolism and color. The succeeding sections are on the thorax, the abdomen, the cuticle, the nervous and sensory systems and the blood, hormones and pheromones. Each of these sections is also subdivided as is the section on the head. The discussions of each topic are very lucid and references are given to sources and to more comprehensive treatments of the subject. The illustrative material consists of line drawings of excellent clarity and quality which complement the text. There is an extensive bibliography as well as both subject and taxonomic indices.